

BOOK TWO

CHAPTER XIV

STRUCTURE OF THE b PSYCHE

i. CORROBORATIVE DOCUMENTATION CONCERNING FORMATION OF COSMIC HUMAN PSYCHIC COMPONENT

a. Notes Concerning the Ivory-White Bodies

A final write up of the notes concerning the ivory-white bodies, done during July 1950, is titled, "Final write up, July 4, 1950, of notes made August 14, 1932, concerning clairvoyant study of some part of histology of either the inferior lobe or pars intermedia of the human epiphyseal complex,"¹ and bears the alternate possibility of phrasing, "... either pars intermedia or inferior lobe of human epiphyseal complex, clairvoyant observation of." Sitting in the otherwise deserted, except for the bartender, dim, old, fragrant, wood-panelled bar room near the lovely old fountain in the restaurant of the old Woodstock in New York; because it was excessively hot and the bar was air-conditioned and the fountain made its pleasant sounds as undisturbing undertones, I wrote as follows: A field comparable to a microscopic field of about X 400 magnification, I suppose. Both histology and function were observed.

1. Microscopic, ivory-white ovoid bodies each situated within a surrounding (matrical?) densely granular or cellular area which is composed of spherical pigmented globules. These are found in one part of the field only. These pigmented nests were clustered masses of globular-shaped pigment within the center of each such mass of which lay a single ivory-white body, ten to

fifteen times the size of a single globule, possibly one-fifteenth the size of the entire nest. Each ivory-white ovoid body and each pigment globule (cell?) was surrounded by a clear space which was filled with a lecithin-like(?) substance. Each pigmented nest was clearly defined in outline, being irregularly spherical, and appeared to be encapsulated.

2. In another part of the field other ivory-white ovoid bodies which seem in every other way identical with these of the pigmented nests are in a seemingly clear space, not being surrounded by any pigment. They lie the same distance from each other as do the first and would seem to be or to have been within the center of an area of the same extent as the other and I cannot say whether or not this area is encapsulated.

3. In (microscopic) fibrillae-like channels a colorless transparent plasma-like substance moves slowly. Glistening (molecular, crystalline, crystalloid?) accretions (granules, granulations?) of a yellowish-reddish, greenish golden-bronze color, which are highly refractive are moved along within the plasma channels by the moving plasma, over clearly defined, definite routes which are just wide enough so that one granule at a time moves along the plasma channels. The plasma channels pass among the nests of the nested ivory-white bodies beginning at the lower left of the field of observation among the unpigmented-nested ivory-white bodies and upward, slightly toward the right of the upper margin of the field among the nests of pigment-nested ivory-white bodies. The plasma flow is in this one direction only. As the granules move slowly along with the plasma, their color and refractiveness are very beautiful.

These types of tissue structures made up the field observed: ivory-white bodies, pigment globules and a lecithin-like substance organized within a surrounding capsule; ivory-white bodies not surrounded by pigment globules but in the same space relations; plasma channels within which moved granule-laden plasma. The action observed in this field was that of the slow, uninterrupted, granule-laden plasma flow; the sudden transient emission of the five varicolored radiants; the formation of the indigo-colored aura around the radiants; the disappearance of the radiants; the remaining of the indigo-colored aura.

The lumen of the fibrillae-like channels through which the plasma-like substance flows, carrying forward the highly refractive crystal-like granules in single file, apparently is no larger than will accommodate a single granule. These granules as they proceed single file maintain a regular appreciable distance from each other which is about twice the distance between the granule and the wall of the channel, which suggests the probability of a constant spherical field of some sort which surrounds each granule and which functions as an outer morph of the granule, but I did not see a substance of which this field might be composed, only the constant and unvarying indication of its existence in

each granular instance. The channel itself is about twice the diameter of the granule so that one suggests the diameter of the lumen of the channel itself to be a millimicron (?), or so, larger than twice the diameter of the granules which move through it. These channels were not with blind ends in any instance and therefore did not represent some final portion of some purveyance system. The granules moved toward and among and past those ivory-white ovoid bodies, which were not surrounded by pigment nests. The granules were all of the same size. There was no indication that as they moved they absorbed the prismatic rays as these emerged from the ivory-white bodies and spread fanwise in the direction of the moving granules. The rays seemed to become to be the indigo-colored aura which remained. The granules moved steadily, regularly, uninterruptedly onward. I did not note any anastomosing of these channels. Can they have been fibrils of --- Or arterioles --- Not lymph channels?

The movement of the granules proceeded onward at a regular and unvarying pace. The distances between the granules did not change. The granules neither diminished nor increased in size during the observation, remained seemingly unchanged, which is characteristic of enzyme molecules. The channels entered the field in its lower left to approximately midline portion, ascended through the left half of the field and left through the upper left to approximately midline portion, having remained throughout in the left half (approximately) of the field, covering a little also of the more mesial portion of the lower one-half of the right half of the total field. I did not note the limiting walls of the microscopic channels; but they were distinctly conduits, flow-channels through which flowed granule-laden plasma moving in definite routes.

In the field which I observed, the nests and nested ivory-white bodies were in the upper right field, fanning a little toward the lower right, and the balance of the somewhat circular field (as in a modified microscopic field) was occupied by the naked, or unnested ivory-white ovoid bodies, the channels, the glistening refractive granules moving in one direction through those channels and the prismatic rays of emitted light, portraying thus a distinct demarcation of differentiated function in the two fields. No limiting membrane or trabeculae of any kind separated the two fields. One ceased where the other began, that is all.

The waiter moved me over to the table in the palm-fronded window niche, served me something - cold ham and crisp lettuce - that kind of whole wheat bread that hasn't any sweetening in it, and an aspic with the ham. Removed the remains. And I made a series of drawings of which these are two².

Would have completed the set, but quiet, insistent movement of some sort kept suggesting subliminally that I detach my attention. I did. The lady who belonged in the window niche, fresh and ready for duty, sat on a stool at the near end of the bar, feeling disqualified and possibly a little resentful; but quietly so under the bartender's shushing countenance. So I made my manners with the lady, my thanks to the courtesy of the cocktail shaker, and so on, for a very friendly Fourth. Barmen, the world over, are protective. And completed

the set of drawings elsewhere - I think in the restaurant at the table next to the fountain with tea and scones, deserted at that hour. The waiter looked discretely over my shoulder and was quietly interested.

Dec. 23, 1962, Martin³ made 60 exposures of Cullen's section 26 of specimen HEC XIV. The following week he took the films to New York City and blew up a few, which he then brought back to Philadelphia to the Foundation workshop. The lower arrow which I have drawn on the margin of the paper on which the photo is mounted indicates the region in which these fantastically small lumened channels show up almost stereoscopically⁴. The upper arrow indicates what may be one of the nests but the photo doesn't show it up very distinctly nor does it show the ivory-white body; other photos will catch these details. The lumen of the channel here blown to this magnification is in actuality approximately 1/140 of a micrometer in width if the records of Cullen and of Martin are correct and I have computed them correctly.

The following evening, in my room, as the night air cooled, I had written further, possibly in some repetition; but filling in minute details as accurately as I could: as follows. As the granules within the channels along their routes move toward and just as a granule passes an unpigmented-nested, ivory-white body, the ivory-white ovoid body streams forth fine delicate rays. each of a different prismatic color in a fan-shaped effect which emerge from only one very small point in about the center of the surface of the ivory-white body and fan outward in the direction of the channel. The flash is instantaneous, timed exactly to the closest proximity of the granule, and is gone even as the granule moves onward. Concerning the prismatic rays which emerge from the unnested ivory-white ovoid bodies in my original notes I have written, Six, fine, delicate rays of light emerge from the naked ivory-white ovoid bodies. Each ray is a prismatic color. Their delicacy and beauty, their color, their arrangement, their intensity of potential; these are reminiscent of those of the rays which emerge from the almost transparent yellow of the tip of the luminous inverted cone which appears in the zenith of the central cube of the hexagon with the central point -- here I meant the n d n that is the human being before it begins to form its extracosmic body-- a single emission of the rays of prismatic light which lasts a perceptible period of time which is much less than a second, which latter is the shortest appreciable time unit which I am capable of reporting in exact nomenclature. As it emerges, each ray fans outward toward but does not impinge upon any one of the granules as they move onward at an unvarying pace within their channels past the ivory-white body. I did not see where the granules went nor what they did other than seeming to set off the light emitted by the ivory-white body but they were glistening, highly refractive, crystal-like, yellowish-reddish-olive greenish. (I want to say like finest yellow sand which is chiefly silicon but I am not certain that this is correct).

The pigment globules of the pigment nests are of the proportion, relative to the ivory-white body which lies at the center of the nest, as indicated in the accompanying illustration. Although they were discrete, sharply defined in the surrounding medium, I did not see any walls or limiting membranes of any

kind, even though the indications would point to that possible conclusion. Are deeply pigmented with a dark pigment. Are spherical in form. Have no fibrillae of any kind either immergent or emergent. Are densely compact within the nests. I would suppose that they give origin to and support and nourish not only the structural elements, but the functional activity, as well, of the ivory-white body which is the center of the mass. The pigment of the globules is quite apparently a local further fabrication of a highly specific molecule which receives its preliminary synthesis somewhere, is purveyed to the nest, there receives its penultimate anabolic processing and passes thence to the ivory-white body and is therein transformed into a final anabolic product which occurs probably either in a crystalloid or a crystalline form. Several years later I added the following comments. The nests of the naked ivory-white bodies are probably none other than the pigmented nests after all of the offering of the pigment molecules has been transferred to the ivory-white body. And only after this has occurred, do these ivory-white bodies become radiant as the granules of the channels pass by. And I saw them in both states.

The naked, unnested, ivory-white bodies lie no closer to each other nor any farther apart than do the pigment-nested ivory-white bodies. I did not note down whether these were encapsulated but am under the impression that they were, and that the capsule was of the same size as that of the ivory-white bodies in their pigment nests and that the surrounding lecithin-like matrical substance was identical with that of the pigment nests. The only difference seemed to be that the pigment was not present, although the actual encapsulated non-pigment-containing globule may have been.

In a discussion for my files, I wrote, during that earliest period in Paris, that these ivory-white bodies are like pearls. That each is an organ with an inner structure and that the perfection of their final function is intimately related to the perfection of the lamination.

I drew these two illustrations⁵ and marked them “trabeculae” which surround each pigmented cell nest like a trabecular wall and almost seem to be continuous with trabeculae of other, neighboring, pigment nests. I cannot say. Neither can I say whether these trabeculae, if present, dip into the pigment nests and form there a trabecular framework but am of the quite strong impression that they did not do so in the field observed. And in my accompanying notes wrote: The pigmented cell nests apparently are contained within trabeculae which seem to be continuous with trabeculae of other nests. I cannot say. Each such nest is a discrete formation indicating the possibility of such trabeculation. In other notes accompanying other drawings which I made that night I have written: I cannot say that these trabeculae form true channels of any kind for I did not look to see especially. But I am under the impression that no moving object such as the granules traversed them for I was paying minute general attention and observed these other minute details which I here report and did not observe any movement through the trabeculae.

In an illustration reproduced by Tilney and Warren,⁶ Henle⁷ shows this same

nested formation as a follicle surrounded by a capsule. The follicle is filled with pigmented cells surrounding the centrally-lying laminated concretion. He indicates faintly a channel flowing between the encapsulated nests. He shows some nests in which his particular sectioning of the specimen did not catch the concretions. In 1812, Wenzel,⁸ found what he thought to be granulations of two kinds in the human epiphyseal complex which he classified according to their color as yellow and white. Called variously, acervuli, concretions, granulations, brain sand, the original structure which becomes the laminated concretions is the ivory-white opaque body. As to the yellow, flavin is yellow; all of the carotene pigments are yellow; certain melanins look yellow. Its molecules deeply pigmented and closely packed, any granulation, either in a cell or having been secreted by the cell, looks so deep a brown as to appear almost black, the darkest part of a chestnut. Fleisch⁹ found, and many others have corroborated the finding, that the parenchyma cells of the human epiphyseal complex anabolize a specific pigment molecule.

In March 1963, I located in Cullen's specimen HEC 14, section 26, and Martin attempted to produce the photomicrographs of a single ivory-white body, zooming the lense gradually and photographing successive levels. When Martin developed his films he found that something had gone wrong: he had only blank unexposed films.

I re-examined the specimen. The single, beautifully clear, opaque, ovoid ivory-white body is still there. Martin will try again.

b. Histological Placement of the Ovoid, Opaque Ivory-white Body

In neohomozoa all of the parts which Turkewitsch so meticulously describes, his vorderlappen, hinterlappen and the part which grows up from the margin of the hinterlappen around the epiphyseal arch, insinuating itself between the vorderlappen and the arch; all three of these after being formed, each formed of its specific cells, become invaded by the so-called connective tissue. And because of the very lack of understanding which accounted for and permitted the continuance of the use of the term, connective tissue, this fact was classically considered to indicate that at this stage in the human ontogen the developing epiphyseal complex began to undergo involution, degenerating into a retained rudiment! First, then, it becomes necessary to know this so-called connective tissue for what it is.

In the five-tiered inner organ of the hexiconcentric homozooan blastocystic morph, the middle colloidal tissue layer is a colloid called collagen. This is the basis of all "connective tissue" evolvment as the metamorphosis accomplishes itself. Into that collagen the upper cellular tissue layer sends a tubular extension made up of its cells which is filled with the colloid of the upper, colloidal, tissue layer. These three, the collagen of the middle colloidal tissue layer, the cells of the upper cellular tissue layer and the colloid of the upper

colloidal tissue layer interrelatedly produce a tissue system which has come to be known as the connective tissues, and are even yet looked upon as cells which produce only purely sustentacular tissue, with no further function. What these cells actually are, is this: the producers of all of this prosencephalon's metamerized organism other than that part produced by this upper cellular tissue layer and its superposed upper colloidal tissue layer; that is, all but the neural tissues and their derivatives and some digestive tissues formed of the lower cellular tissue layer. In other words they produce the cosmic organism which this prosencephalon is building for itself. They build it of this collagen which needs ascorbic acid, vitamin C, to keep it stabilized as they build it in that developing metamerized morph. It is the ¹⁰ ... of this so-produced tissue system, properly called the mesodermal system, which now becomes a fourth factor in neohomozoan epiphyseal histogenesis. In the neohomozoan ontogen, soon after they form, all three of these so precisely intermosaiced parts of the human epiphyseal complex begin to become to be thoroughly invaded by these so precisely fabricated cells coming into it from the proximal end as the onset of the final stage of its ontogenetic development. These mesodermal cells send out long fibers which connect them with each other, forming thus a continuous network. Meshed thus among the cells of the vorderlappen, the hinterlappen and the pars intermedia, they organized the cells of these three diverse regions as they continue to proliferate into lobules, acini, diverticula, some of which are so small as to be comprised of from several to less than 100 parenchyma cells and must be magnified many hundreds of times in order to be seen by the human retinal visual process. Magnified close to 2000 times, the fibers of these mesodermal cells are seen to surround each single cell of the parenchymatous tissues.

Individual cells of the mesodermal tissue system differentiate, some forming these fiber meshworks, some becoming differentiated into secretory cells which have to do with the deposit of molecular calcium phosphate and molecular calcium carbonate in the networks, placing themselves at strategic points in the network and remaining stationary there, secretory, as the highly important true osseous tissue without which as a surrounding concentric cylinder¹¹ no central nervous system, no prosencephalon, no uperprosencephalon, no epiphyseal complex can achieve its true function in the neohomozoan organism. This neohomozoan osseous tissue absorbs all vibratory wavelengths up to the long x-ray, screens the central neural tissues from these wavelengths, transforms the absorbed lengths, emits them into the metamerized organism as humanly usable by the central tissue derivatives of the upper cellular tissue layer of the five-tiered inner organ of the hexiconcentric homozoan blastocystic morph. Researchers have found what they have reported to be molecular granulations of calcium carbonate and calcium phosphate combined with proteins in the homozoan epiphyseal complex. Martin's enlarged prints of his photomicrographs of some of the sections of Cullen's HEC 14, show some of these microscopic acini with a single mesodermal cell at the center as though lodged there. The cell has a minute nucleus exactly centrally placed; is pale under the stain used. In other similarly placed similar cells in similar

acini in this same section the cell as such is no longer discernable but a faintly showing faintly opaque ivory-white body seems to have replaced it - or can it be said that the cell has become to be the opaque body? In still other identical acini, the faintly showing, faintly opaque white body is less faint. In others an opaque microscopically laminated, ivory-white ovoid body is discernable. In the mounting literature on bioluminescence, it is well recorded that light-rich phosphorous is one of the important factors in the luminescent reaction.

ii. PHOTOGEN ORGANS AND CHROMOGEN ORGANS

a. Photogens

Every periodic pattern of periodic motion produces and emits a periodic mutation of periodic motion. At a certain stage of their evolvment. cosmic periodic patterns of periodic motion are called material energy forms; their periodic mutations of periodic motion are called vibratory energy forms. In American science nomenclature, vibratory energy forms are called light, magnetic waves, etc.¹² Vibratory energy forms which affect the n d n | that form the receptor apparatus of the human retina in a certain manner are called visible light; above that, ultraviolet, below that, infrared. The vibratory energy form of the visible gamut must be of a certain intensity in order to so affect the retinal receptor apparatus that it forwards a stimulus to the prosencephalic cortical center of visual awareness. Visual rates of less intensity cannot be seen by this particular cortical center and are therefore apt to be considered as not being there. With the help of an intensifier, the center can detect them. It has long been known that those mutual reactions which occur between the type of n d n called material energy forms that are known as chemical reactions consist of the transfer of electrons from one molecule to another. It has only recently become known to modern science that this chemical reaction is always accompanied by the emission of vibratory energy forms, some of which always fall within the range of the type called visible light. The specifications of the emitted vibratory energy form depend upon the molecule which releases the electron. It has also long been known that faunal and floral organisms emit a wide range of vibratory energy forms and that in certain types of each the emitted vibratory energy forms comprise within their range those of the visible gamut. Such men¹³ as Aristotle, Pliny, Dubois, Franklin have been intrigued by the fact. This fact of the emission of vibratory rates within the humanly visible gamut does not necessarily mean that they emit no vibratory energy forms above or below this range. Shall one say, rather, that some of the vibratory energy forms emitted by these organisms are within the humanly visible range. More recently it has become known to modern science that both faunal and floral organisms develop special organs, the specific functioning of which emits light waves in the humanly visible gamut, and apparently no


other rates. The emission of vibratory rates of the humanly retinally visible gamut is called bioluminescence. Any organ that emits specific vibratory energy forms is called a photogen. Any organ that emits specific vibratory energy forms in the humanly retinally visible gamut is called a bioluminescent photogen. In bioluminescent faunal photogen organs, two types of granules are found: yellow granules and white granules. These are associated with lipid materials, such as fat droplets. Cullen's drawings show formations that can scarce be else than lipid droplets, both inside of a certain type of cell, and outside. Her reported sections will be rechecked under magnifications sufficient to verify accuracy of reporting. Then fresh sections will be stained with special stains to verify fat.

b. Chromogens

Every material energy form receives some specific one or more types of vibratory energy forms within its internal economy, transforms them by breaking the received forms down into simpler forms and rebuilding them into forms that are greater in potential, potency and potentiality than was the sum of the received forms, and do one or several of a specific range of possibilities with the so transformed vibratory energies. Each known atom in the cosmic gamut of the total manifestation of the one eternal becoming of the ability eternally to cause periodicity eternally to become manifesting in a periodic continuum of eternal motion absorbs vibratory energy forms of those specifications which its structural organization and internal movement permits. Molecules absorb vibratory energy forms in ranges specific to the molecule. In both atom and molecule some of the absorption bands are within the humanly visible gamut. But that fact cannot necessarily mean that these are the only vibratory rates which atoms and molecules absorb. Protoplasm, plasmodia, simple one-celled organisms and the many-celled organisms, both faunal and floral, absorb selected vibratory rates: some of these are within the humanly retinally visible range. Both faunal and floral organisms develop organs for the special reception of special vibratory rates. Such organs are called chromogens. When the range of rates receivable by the organ lies within the humanly retinally visible gamut, the organs are commonly referred to as photoceptors. Photoceptors of certain complexity of organization are called retinae, and the entire organ involved in retinal photoception is called an eye. All organs that receive vibratory rates are evolved upon some arrangement of pigmented cells. Hence the term chromogens, organs that give origin to pigment. Not such very good nomenclature.

Just as not all vibratory rates received by any given n d n are necessarily within the humanly retinally visible gamut, so not all vibratory rates emitted by any given n d n are necessarily within the humanly retinally visible gamut. It follows that any cosmic n d n, any material energy form, any faunal or floral organism may develop organs that emit specific vibratory rates other than those of the humanly retinally visible gamut, and, in corollary, may develop organs

that receive specific vibratory rates other than those of the humanly retinally visible gamut. This is demonstrably true of homozoa. All through this work I have borne witness. Millions of homozoans have borne equal witness, through all ages. If the homozoan upeprosencephalon can see other than that which is projected to it by the in-fibers of the retina, then the homozoan organism has developed some demonstrable organ which receives these wavelengths. The fact that for photoception only the existence and function of that organ called the retina has been demonstrated by modern science does not in any sense even tend to exclude the possibility of other photoceptor organs, long known in the z r science, unknown to the painfully limited American science of anthropology. Whether, bound within those limitations, any one not having used his full accoutrement cares to credit the authenticity of the reports of those who have used their full accoutrement, or loosening his bonds somewhat lends them a modicum of his credence, this bond-man cannot in either instance annul the facts. None of the mndn, vibratory energy forms, glows, radiants, etc., which I have heretofore in these first two of the books of “ --- by reason

of the speech of  --- ” either described or alluded to are in the retinally visible gamut, nor are they received by any portion of the retinal receptor apparatus. Nor are these radiants of the ivory-white bodies within that gamut: they would be within or beyond the far ultraviolet range.

c. Homozoan Epiphyseal Complex, a Photogen-Chromogen Organ

According to this observation, some histologic portion of the homozoan epiphyseal complex other than the histologic superior lobe is a photogen; it produces and emits vibratory wavelengths of a specific order, that are not of the visible gamut and it does this in a specific manner. This manner is related in some way with ivory-white oval granulations and yellow granulations so deeply pigmented and closely packed that they appear deep brown, almost black, with some phospholipoid material which I associated chez-lecithin, and in some other way with glistening bronze-green, etc., granules which seem to instigate the emission without taking part in the chemical reaction, and may be the oxyhemoglobin of red blood cells passing by in single file in microscopically fine arterioles. According to another of this series of observations, certain crystals of the histologic superior lobe of the neohomozoan organism which the z r science calls the b crystals are the initial parts of a photoceptor mechanism of a specific order. The vibratory rates which the b crystal can and does receive are specific human periodic mutations of periodic motion. This makes of the homozoan epiphyseal complex a photogen-chromogen complex of a specific order; the order peculiar to the human phylum. The neohomozoan ontogenetic development as regards photogenesis-chromogenesis is interesting and, possibly, informative concerning the photogenesis-chromogenesis of the epiphyseal complex of the metamerized morph.

d. A Critical Mass

In passing from its pre-chordate to the chordate stage of its embryonal development, the neohomozoan organism interludes an anlage of an organ that is causative of the formation of the morphon that has been given the name notochord. After the upper cellular tissue layer of the five-tiered inner organ of the homozoan hexiconcentric blastocystic morph has arrived at that stage of its development in which it is the newly forming prosencephalic primordium, having so exquisitely mosaiced the molecular templates of the four antimeric developmental zones, immediately then, following upon the first growth of the upoprosencephalic antimeric developmental zone and before the antimeric motif of this zone of the template has begun to become placodal, the cellular apex of that fan-shaped cluster of cells of this upper cellular layer of the five-tiered inner organ of the homozoan blastocystic morph which forms the region of the prosencephalic primordium involving the posterior pole of all four concentric circular prosencephalic antimeric developmental regions, centered in the central axial diameter at the center of the transverse diameter and, spreading through the sector from radius 135° to radius 225° , begin to multiply rapidly as though at this region some special impetus had ripened and become active; this minute specificity of the prosencephalic biochemical template now become placodal. Sir Arthur Keith,¹⁴ in his *Human Embryology and Morphology*, calls it an acute proliferation of cells. Known classically as the primitive node, it is sometimes referred to as Hensen's node because Hensen was one of the people who did fine work in examining and reporting this node. Joseph Needham,¹⁵ in his *Biochemistry and Morphogenesis*, refers to its analogue or homologue in those extrahuman forms in which it is classically called the dorsal lip of the blastopore as the organizing center. I am indebted to Martin³ for his terminological suggestion in speaking of it as it occurs in homozoan ontogenesis as the critical mass of the developing metamorphosis of the neohomozoan organism.

In the neohomozoan ontogen, this development occurs as the critical episode in the metamorphosis of the prechordate morph into the chordate form. It occurs as a development of a specific minute area of the prosencephalic primordium. By means of this mass the morphosis proceeds. Something which this mass secretes and expresses, some specific mndn, gradually and surely ensures the success of the metamorphosis.

Needham,¹⁶ who calls the molecular substance released by this mass of cells an evocator substance, reports that results of research studies suggest this molecular substance released in certain extrahuman vertebrate analogues is an enzymatic, polyclinic hydrocarbon steroid of a hormonal order which oxidizes photochemically: and suggests the possibility of its anabolic relationship with a molecule called cholesterol. Sterol molecules are fabricated in one manner and another in invertebrate animals: in still other ways in the simplest vertebrates: in still other ways in the placental vertebrates: in still others in the mammalia.

In the homozoan placental mammalian vertebrate, the process would be a homozoan anabolic specificity forming the exact periodic pattern of periodic motion which is the homozoan molecule of cholesterol. For its photochemical reaction, Needham suggests the possibility of a relationship with a lipochrome pigment.

e. This I Saw

During one period of my studies, I had needed to know of my instructor the following, relevant to this stage of homozoan evolution and neohomozoan development; its significance being that of the specific photochemistry of the specific light patterns released. Collecting and concentrating on what knowledge I carried in my mind concerning this stage in the developing early neohomozoan ontogen, and opening the ways of intercommunication, I watched for what should transpire upon the screen of lucidity that the homozoan upperprosencephalon forms for purposes of certain types of cognitive reception. There, in approximately 2,000 times magnification, some portion of this area that is the upper cellular tissue layer of the homozoan blastocystic morph at the stage in which it was the so-called medullary plate came alive as a living background, in color like a very deep-toned purple melanin in which light-emitting crystals were the point at issue. Each crystal was made up of a cluster of thin, transparent, petal-like, colorless units, all of the same shape, set together more or less like the regularly clustering petals of a multi-petalled flower. The cluster was the crystal. I should have so done but did not count the units in the cluster; however, upon revisualization decided that there were about 30 units forming each cluster. All of the clusters were identical. And save a graded variance in size all of the units forming the clusters were identical: those that formed the central part of the cluster were larger than the fringe units.

In the center of a single unit of a crystal a fine point lighted for approximately $1/4$ of a second. At an interval of approximately $3/4$ of a second from the time one unit lighted, another unit of the same crystal lighted in an identical manner. This was followed by another, and so on. Only one unit of any crystal lighted at any given time. The intervals of lighting were regular. The units of each cluster lighted in specific timing of about 80 or 90 lightings per minute. Each point of light came at a specific spot on the unit: the unit relighting always at the same point, approximately the center of the unit. Each point of light was in color like that of the moon when it is silvery and of an intensity approximately that of brilliant moonlight on a clear night in the mid-south of the U.S.A. Almost a blue silver, no yellow: one would suppose then a wavelength close to the indigo category in the far ultraviolet gamut.

Sometimes only one cluster lighted, sometimes several to many clusters lighted simultaneously, continuously; each crystal lighting separately and sequentially, the timing being that of the cluster not of the unit. I did not see more than one unit in a cluster light at any one time: one unit of a cluster lighting, then

another, then another, in a spiraling sequence: I think the sequence formed in each cluster, as also in the entire mass under observation, was that of an angular spiral. I watched them for five minutes at the least. What the lighting atom or molecule that formed the center of each structural unit of the crystal was, I cannot say certainly; I deduced from the lesson that it was a repetitive unit in a tyrosine anabolite of some particular specificity, and that the cluster was the crystalline form of the molecule.

This would mean that the developing neohomozoan ontogen in its prechordate stage is a light-emitting organism, but not in the homozoan retinal visual wavelength gamut. It would also mean that this light emitted by this organism at this stage is the emitted light of a specially constructed light-emitting organ, and that this light-emitting organ is either the entire upper cellular tissue layer of the five-tiered inner organ of the hexiconcentric blastocystic morph at that stage in which it is recognizable as the prosencephalic primordium, or some specific portion of this prosencephalic primordium. The probability that this organism at this stage is equipped with a corresponding chromogen organ is deducible from the foregoing, also that this has something to do with the critical mass and the formation of the notochord; and hence with the formation of the mesodermal tissue system; and possibly, then, with the formation of the opaque ivory-white bodies in the developing epiphyseal complex.

f. The Formation of the Notochord

After the formation of the critical mass, the formation of the notochord is the next stage of the neohomozoan ontogenetic process of metamorphosis whereby the prosencephalic primordium transforms the prechordate embryo into the metamerized vertebrated chordate morph. As this critical mass secretes its enzymatic molecules which need the light emitted by the crystals of the related portion of the prosencephalic primordium to implement the next biochemical ontogenetic reaction, the cells of this mass and these surrounding cells continuing to proliferate, conjointly form the primordium of this notochordal structure which will transform the collagen of the middle colloidal tissue layer of this metamorphosing five-tiered inner organ into the mesenchymal tissue system of the multiconcentric, cylinderized, metamerized, vertebrated chordate morph. As its cells continue to proliferate forming of its superior portion a minute hillock, those of the proliferating cells of the prosencephalic primordium which juxtapose the inferior border of the minutely down-sloping valleyed area of the inferior margin of the critical mass begin to depress into the upper surface of the middle colloidal layer carrying the proliferating cells of the adjacent portion of the critical mass with them.

The continuing acute proliferation of these two varieties of the medullary plate cells of this region of the prosencephalic template, by causing the floor of the region to evaginate, come thus to enter the place between the upper cellular tissue layer and the middle colloidal layer of the five-tiered inner organ of the homozoan hexiconcentric blastocystic morph. The superior wall of this

evaginating extension of that portion of the upper cellular tissue layer which lies along the inferior border of the critical mass of the prosencephalic primordium, that is, the portion which lies immediately under the mass, elongates rostrad, elongating into a hollow tubular extension of the upoprosencephalic antimeric developmental region of the prosencephalic template which grows through this upper region of the colloid of the middle colloidal tissue layer just under the critical mass and continues rostrad from there under the inferior surface of the upoprosencephalic antimeric developmental region of the prosencephalic template: an all but microscopic distance. The lumen of the channel so formed is called the neuro-notochordal canal. The channel itself is called the head region of the notochord. As the organism grows caudad, the opposite wall of the evagination, proliferating, elongates caudad, the developing notochord coming thus to extend through all three morphological regions of the homozyan multiconcentric, cylinderized, metamerizing form: cephalic, subcephalic and sub-subcephalic.

So formed by the proliferation of certain cells of the prosencephalic primordium, it is this notochord which secretes that enzyme and emits that specific vibratory wavelength which correlatedly cause the collagen of the middle colloidal tissue layer of the five-tiered inner organ to develop stage by stage into the mesodermal tissue system of the metamerized, osseously vertebrated, chordate morph; the tissue system which in the homozyan epiphyseal complex produces the opaque ivory-white ovoid bodies while the tissue system developed of the balance of the prosencephalic primordium produces the pigmented granules or globules or cells in which these are nested.

In attempting to bring out the full significance of these foregoing facts, the following review of chordate morphology may be of aid.

1. The Chordata

In this, the current, period of earth's neogeologic crustal era, that portion of the terrestrial edition of the cosm's discrete living organisms which is known as the evolvement of protoplasmic organisms occurs in two known versions: faunal and floral, called animals and plants. Neohomozya belongs to the fauna. Both versions of protoplasmic morphosis of the gās edition of the cosm's living organisms occur currently as noncellular and cellular, the plasmodia being the division line. Cellular organisms occur as monocellular and multicellular, single-celled organisms and many-celled organisms. Collectively they comprise a progressive and cumulative organization of the protoplasm. The fauna collectively are classified as the zoological subkingdom of protoplasmic organisms.

The currently contemporary units of this zoological subkingdom of the kingdom of protoplasmic organisms, that is, of this portion of the cosmic gamut of the total manifestation of the one eternal becoming the periodic patterns of periodic motion which, evolving, produce of themselves these

organisms which are termed the fauna of earth's protoplasmic biosphere, show identifiable cross levels of evolution. Comparative morphologists find that morphologically and anatomically, according to outer form and inner structure, they can arrange these extant protoplasmic organisms of the so-called zoological subkingdom into a composite portrayal of a basic orderly sequence of cumulatively ascending levels of protoplasmic morphosis in which each progressed level shows an accumulation of the morphons of the preceding level plus that morphon which its own level adds. At each level wide and all but bewildering variations of that level's basic architectural scheme occur by means of anamorphoses of the structural morphons which the organisms of the level produce. The sequence of levels so portrayed by this morphological composite of the organisms of the zoological subkingdom of the protoplasmic kingdom, as these are definitely known currently to exist, occurs as noncellular organisms and cellular organisms.

Noncellular ends with the plasmodia. Cellular organisms are monocellular and multicellular. The multicellular organisms are of two kinds: those that arrange their cells into tissue systems and those that do not. Those that do are called blastospheres; those that do not are called morullar masses. Blastospheres, having arranged their cells into tissue systems, are called blastulas. Blastulas that arrange their tissue systems into alternate cellular tissue systems and colloidal tissue systems are known as blastocysts. Some blastocysts have arranged their cellular systems into two, some into three, cellular tissue systems. Some of the multicellular organisms that arrange their cells into cellular tissue systems then further arrange their cellular tissue systems into systems of cellular tissues. These systems of cellular tissues are called morphons. Organisms that form morphons range from those composed of a simple one morphon to those composed of a complex of many morphons in which the morphons are interorganized units of the internal construction of the organism. According to the manner in which these organisms arrange their morphons, these complex multicellular organisms are classifiable into three main groups: Achordata, Protochordata and Chordata. The Chordata are further classifiable as metamerizing and non-metamerizing Chordata. Metamerizing Chordata are classifiable as non-vertebrate and vertebrate. Vertebrata occur as acraniate and craniate. The Achordata include all multicellular forms that do not form a notochord. The Protochordata include all multicellular forms that make unsuccessful attempts at complete notochord formation. The Chordata include all forms that produce a complete notochord. Nonvertebrate Chordata do not form a bony skeleton around the notochord and neural tube; the vertebrates do. Acraniate Vertebrata do not form a cranium; Craniata do. Of those that build a cranium, some build all three metameric segments, some build the second and third, some build only the third.

The Protochordata arrange their morphons in an elongated, quasi-multicylinderized, supero-infero polarized, longitudinally triregionalized, dorso-ventrally asymmetrical, bilaterally symmetrical scheme around a centralizing longitudinal neural tube ventral to which extends a faint indication

of the longitudinal morphon called the notochord. In a form called *Adelochorda* of which *Belanoglossus* is one, the occurrence of this latter morphon is uncertain; but the *Adelochorda* do have a structure that is supposed possibly to be a vague attempt at notochord formation. In *Urochordata*, the ascidians, the dorsal neural tube is underlaid by a notochord in the caudal region only. In amphioxus and lancelets, the dorsal neural tube is underlaid by a notochord in the caudal and precaudal regions, not in the cephalic region.

2. *The Osseous Enhousement of the Neural Tube*

The craniate Chordata arrange their morphons as polarized, cephalized, longitudinally triregionalized, ventro-dorsally asymmetrical, bilaterally symmetrical, multiconcentric hollow cylinders arranged around the encephalized hollow cylindrical morphon called the neural tube, as its core. These craniate Chordata occur as: those with a vertebrated osseous housing surrounding both, the neural core and the ventrally-lying notochord, in all three morphological longitudinal regions, called the central bony axis; those that form not an osseous but a cartilagenous housing surrounding both the central neural core and the notochord; and those that build this housing partly of cartilage and partly of bone. All three types produce the head-covering called the cranium; build it either of cartilage, of cartilage and bone or of bone. These are therefore called the Craniata or the Craniate Chordata.

Craniate vertebrates occur as those with tails and those without tails; both tailed and untailed occur as those without legs and arms and those with legs and arms; those with legs occur as those with four legs and no arms called quadrupeds, and those with two legs and two arms called bipeds.

3. *Regional Development of the Neural Tube*

The achordata build no central neural tube. Of the protochordata some build a neural tube in the subencephalic and sub-subencephalic developmental regions; none build any neural tube in the cephalic region. Of the chordata some build a neural tube in the sub-subencephalic and subencephalic regions and make various attempts at neural tube building in the cephalic region. Of those that build an encephalon some build a prosencephalon, a mesencephalon and a metencephalon: others produce various failures of this stage of the archetypal scheme of protoplasmic evolution. Some of these extrahuman encephalic failures of the protoplasmic morphotic scheme occur as those with no prosencephalon having only a mesencephalon and a metencephalon; others occur with no prosencephalon, no mesencephalon, only a metencephalon.

Of those that produce a prosencephalon, mesencephalon and metencephalon, all produce wide variations of each of these three encephalic metameric segments. Some produce grand metencephalons and poor developments of the other two. Some produce a fair mesencephalon and not so good prosencephalons and

metencephalons, etc. A few produce a fair to middling prosencephalon; of these latter great variations of evolvment of the four antimeric end organs and their respective antimeric developmental regions of the prosencephalon occur. All produce attempts at all four end organs. Some produce an end organ and its upoprosencephalon of creditable development and show very poor evolvment of the other three. Some specialize in the development of the end organ and parts of the thalamanprosencephalon. Some produce hugely overgrown end organs and rhinenprosencephalons; some of which are so comparatively excessive as to all but completely obliterate the uperprosencephalon. Others produce fairly well-balanced developments of these three regions but with marked variation and deficits in uperprosencephalic antimeric end organ and antimeric regional evolvment. Of these some have from no to very poor prefrontal association mantles. Others have comparatively quite good prefrontal association mantles. Of those that produce a fairly good prefrontal association mantle, all extrahuman forms display various degrees of sparsity of evolvment. None show a highly evolved prefrontal mantle such as that of neohomozoa. No extrahuman form produces a pre-prefrontal mantle.

4. *Chordate Neohomozoa*

Anthropo homozoa anima sapiensis gās begins its closed phyletically-produced ontogenetic morphosis as a closed phyletically-produced plasmodium; becomes a monocellular then a multicellular organism. Arranges its cells in cellular tissue systems and their intervening intercellular colloidal systems, forming a hexiconcentric blastocystic morph. Produces thereof a prechordate form characterized by a five-tiered inner organ; undergoes a metamorphosis whereby it produces a chordate form emerging out of this prechordate chrysalis. Arranges its morphons in an elongated, multiconcentric-cylindrical, metamerized, supero-infero polarized, dorso-ventrically asymmetrical, bilaterally symmetrical, longitudinally triregionalized, antimerized, cephalized plan around the hollow, elongated, polarized, encephalized, cylindrical morphon called the neural tube as its core, in front of which, paralleling it, throughout its entire length, it forms this morphon called the notochord; produces a cartilagenous encasement for the two which it then ossifies. Amphibious, having been an aquatic, long-tailed, gill-breather, it has gradually undergone another metamorphosis whereby it now, emerging, becomes a de-tailed, lung-breathing, land animal possessed of a three-metameric-segmented encephalon, a subencephalon and an all but invisible vestige of a sub-subencephalon. Of its three large, highly evolved, complexly organized, encephalic metameric segments, prosencephalon, mesencephalon, metencephalon, the prosencephalon is the largest, the most highly-evolved, most complexly organized. Each of these three encephalic metameric segments has produced marked antimeric developmental regions. The prosencephalic metameric segment has produced four: an uperprosencephalon, a rhinenprosencephalon, a thalamanprosencephalon and an upoprosencephalon. Of these the uperprosencephalon is by far the largest,

the most highly evolved, most complex, most complexly organized. In building this uperprosencephalic antimeric developmental region of this prosencephalic metameric segment of this encephalon,¹⁷ neohomozoa produces a pair of highly evolved hemispheres, an amazingly complexly organized and coordinated hemispherical cortex, a wealthy prefrontal mantle that so far supercedes even the nearest extrahuman approach as to cause the latter to appear all but negligible, and an exclusively homozyan pre-prefrontal mantle.

In homozoa the process of critical mass formation and the process of epiphyseal complex formation are interrelated phenomena. Both occur as developments of specific portions of the template of the prosencephalic primordium. The one is evocative of the development of the mesodermal system; the other is evocative of the development of the ectodermal system. Within the fully developed epiphyseal complex in the phenomenon of the ectodermally nested, mesodermally produced ivory-white bodies and their pigmented nests, the two present a meaning.

g. Concerning the Epiphyseal Complex

During the early stages of their ontogenesis all encephalized vertebrates make some attempt at the production of an uperprosencephalic antimeric end organ as the first stage of an attempt at the building of a four-prosencephalic-antimerized, three metamericly segmented encephalon. Called the epiphyseal complex, this end organ, in all cases, is built on the outer surface of an end bulb¹⁸ of a tubular extension of the dorsal region of the rostral end of the encephalic region of the neural tube called the epiphyseal arch or dome of the roof-plate of the forebrain vesicle. In neohomozoa this dome is a post-dorsal closure, commissural fusion across the midline of two bilateral ante-dorsal closure tubular extensions of the arcing medullary ridges, representing thus in a single midplane tubular extension the earlier pair of bilateral tubular extensions. And, in neohomozoa, the end bulb is formed by a proliferation of the cells of this closed end of this tubular extension. The end organ is built of and upon the outer surface of this end bulb in the manner first told by Turkewitsch as herein above retold.

If, in the grand march of protoplasmic morphosis as it proceeds on this planet of this solar system of this galaxy of this system of galaxies of the cosmic gamut of a one eternal becoming, the homozyan organism in all of its morphotic stages comes nearest to materializing the phantom of that stage then these stages may for purposes of comparison be considered as manifestations of the archetype and at all stages all extrahuman forms may logically be compared and the comparative development of the progressive stages of this end organ discussed in this frame of reference.

h. Concerning the Epiphyseal Complex in Extrahuman

Morphs

No anencephalic produces any indication of an epiphyseal complex. All encephalics do. Encephalized vertebrates occur as the eel-like cyclostomes; the fishes of which there are four subclasses: Elasmobranchii, Holocephali, Dipnoi and Teleostei; the Amphibia such as frogs, toads, salamanders; the Reptilia, which include the prosaurians, saurians, snakes, turtles, crocodiles; the birds; and the Mammalia, animals that suckle their young. All encephalized vertebrates form an epiphyseal complex of one sort or another. In these, all attempts at encephalization are initiated by the formation of an epiphyseal dome of some sort, which in each case is a homologous or analogous variation of the homozyan evolvment of this tubular extension called the epiphyseal arch or dome. In no extrahuman form does it occur exactly as it does in the human¹⁹. And, upon these variations of the homozyan archetypal epiphyseal dome these extrahuman encephalizing chordata build wide variations of the homozyan evolvment of the vorderlappen and hinterlappen. Some fail to produce a discernable vorderlappen, producing only the hinterlappen. Some produce the faintly discernable beginnings of a vorderlappen and a hinterlappen, in which the faint beginnings of the vorderlappen fail further to develop and gradually disappear while the hinterlappen continues to develop. Some produce a hinterlappen first, then much later produce a vorderlappen which either does or does not continue to develop. Some produce a pars intermedia, some do not.

Instead of the gradual interorganization of the vorderlappen, pars intermedia, and hinterlappen by means of tissues derived of the middle colloidal layer as the collagen of that layer is organized by the developing notochord into a single complex, highly organized histology, those extrahuman forms in which both lappen occur or only one occurs carry the evolvment of each or either lappen separately into variations of approach to attempted fulfillment of the archetypal expectancy of faunal protoplasmic evolvment on this planet, so that instead of an end organ comprised of an interorganized histological superior lobe, histological pars intermedia and histological inferior lobe, these forms produce of their homologue of the vorderlappen an organ which has been given the name parapineal; of their homologue of the hinterlappen, an organ which has been given the name pineal; and of the pars intermedia, an almost complete failure of evolvment. In these, each of these organs, the parapineal and pineal, when present in full, produces an end vesicle, a stalk and a proximal portion: some produce all three parts; others produce variously one or two parts only.

Because due to lack of pertinent ontogenetic information certain fallacious deductions have occurred in the past which are, but should not be, still regarded as facts, the entire homozyan epiphyseal complex has been and still is, among the less exactly speaking, referred to as the pineal; it is well here to drop the parapineal-pineal nomenclature and refer to these extrahuman structures as

extrahuman developmental variations of homologues or analogues of the homozoan histologic superior and inferior lobes of the uperprosencephalic end organ, respectively: the histologic superior lobe being the development of the vorderlappen, the histologic inferior lobe being the development of the hinterlappen. Thus: parapineal = extrahuman homologue of homozoan histologic superior lobe; pineal = extrahuman homologue of homozoan histologic inferior lobe of the epiphyseal complex.

Since in neohomozoa the formation of the notochord is caused by the critical mass and the juxtaposed dorsad cells of the uperprosencephalic template, and this notochord causes the collagen of the subjacent middle colloidal layer to produce all of the mesodermal tissues of the metamerized organism and, since the interorganization of the vorderlappen, pars intermedia and hinterlappen into one complexly interorganized whole, by means of mesodermal tissue, and since this notochordal function is a photogenic-chromogenic biochemical reaction, then the importance of a realization of the possibility of a relationship between the fact of the massive invasion of the parenchyma of these three contributory parts, the vorderlappen, pars intermedia and hinterlappen, by mesodermal cells and their progressive histologic organization of the parenchyma cells - - - the possibility of a relationship between this and the formation of the structural organization of which the ivory-white body is the center and the emission of specific light vibratory energy forms by each of these minutely organized structures - - - the importance of this realization presents itself for further consideration.

Since it is the presence or absence of the initial formation of the critical mass with its subsequent production of the notochord which marks the difference between the non-chordate and those prechordate stages of all organisms that will become chordate, and since this particular stage of protoplasmic morphosis seems to imply a photogen-chromogen enzymatic reaction as the evocative factor, then a comparison of the photogenesis-chromogenesis of nonchordata and chordata, and a further comparison of the phenomena as they occur in the various chordate forms may be informative in attempting to estimate the relationship of these phenomena with the homozoan epiphyseal complex. For that purpose certain classic published works in these two fields of research in comparative morphology are available.

In that one of his books which he titled *Living Light*, Harvey²⁰ gives a comprehensive rehearsal of bioluminescent fauna. In his Chapter II which he titled "Light-producing Organisms," he describes in some detail the specific light-producing organs of these organisms. He also, in this book, refers to the fact that photogen and chromogen organs are almost universally found in close proximity with each other, sometimes actually resembling one complex. He writes only of extrahuman organisms. He completes his Chapter II thus, "Fish are the highest group of animals in which self-luminosity is known. All the reported cases of light from amphibia, reptiles, birds and mammals have been due to some secondary phenomenon." In their treatise of 1919, which they titled *The Morphology and Evolutional Significance of the Pineal Body*, Tilney and Warren²¹

reported in equal detail most of the bibliography on the epiphyseal complex, extrahuman and human, extant at that time. A comparative analysis of these two reports yields the deduction: in that morphological level of protoplasmic morphosis in which external bioluminescence in the human retinally visible gamut begins to leave off, indications of the formation of an epiphyseal complex begin to occur. Be our observation and its interpretation correct, this following deduction is within the realm of logic: in neohomozoan ontogenesis the prechordate stage is photogenic-chromogenic in the far ultraviolet; the beginning of the metamorphosis from the prechordate to the chordate form is coincidental with the beginning of the formation of the prodromes of the epiphyseal complex. Both occur as incidents in the development of the prosencephalic primordium.

Harvey stresses the facts that photogenic organs are almost invariably accompanied by chromogenic organs; that histologically these photogen organs and chromogen organs are so very similar as to cause difficulty in differentiating them histologically. In his *Living Light* he remarks, "Luminous organs have often been mistaken for eyes. The reason is obvious; they are eyes in reverse. Chemical production of light is the converse of chemical detection of light," and continues to show the histological similarity of construction, etc. Elsewhere he remarks upon the fact that almost always photogen organs and chromogen organs are found situated in close proximity, writing, "The light-forming organs of fishes are almost universally accompanied by an organ which can be nothing other than a screen or light-ceptor organ," and, "In fish also a subocular luminous organ is common, and one may raise the question without offering a logical answer, as to why there is so frequently a close association of light-emitting and light-detecting organs."²² No researcher in the comparative development of the epiphyseal complex seems to have known this. Whenever a histological structure was come upon by those researchers whose reports Tilney and Warren record that looked histologically anything like the retina in any of its forms, from the simplest to the most complex, that tissue was interpreted as being a chromogenic tissue, a light-ceptor mechanism, an eye. It can as easily have been a photogenic tissue, a light emitter mechanism¹⁹, the reverse of an eye. A brief summary proves interesting in that it gives evidence of a certain progressive correlation of evolvment of the morphons called photogen-chromogen organs, notochord, bony tissue surrounding notochord and neural tube, encephalization and epiphyseal complex suggestive of an archetypal synchronism of this phase of morphon development in protoplasmic morphosis instigated, and continuously regulated and governed by some one leading factor functioning. In making a comparative study these two things need to be kept in mind. (1.) The organs of the bioluminescent photogen-chromogen complex grow anywhere over the exterior of the organism allied with the integumentary neural system; the epiphyseal photogen-chromogen complex grows only in one place, inside the organism on the superior portion of the dorsal surface of the roof plate of the forebrain, allied with the central neural system. (2.) In homoza the chromogen portion of this photogen-chromogen complex differs from the eyes. The eyes with their complexly

organized retinæ are end organs of the thalamoproencephalic antimeric developmental region of the prosencephalon. Evolving eyes are adapted for photoreception of whatever sunlight the organism receives, cosmo-receptors of a specific order. The epiphyseal photogen-chromogen complex is the end organ of the homozygous upperprosencephalic antimeric developmental region of the prosencephalon. The evolving chromogen portion of the photogen-chromogen complex is adapted for the reception of whatever light-vibratory patterns the photogen portion of the photogen-chromogen complex of its phylum emits.

Tilney and Warren list the manner in which the epiphyseal complex with reference to the so-called parapineal and pineal develops in the various types of fauna while Harvey lists the manner in which the so-called luminescent organs develop. Putting the two together the result comes out as follows: One class of cartilaginous, vertebrate, encephalized Chordata, called the cyclostomes, comprised of the eels, lampreys, hag-fishes, do not luminesce. The epiphyseal dome occurs as a double evagination, upon the more caudad one of which the homologue of the homozygous histological inferior lobe develops first, then somewhat later upon the other the homologue of the histologic superior lobe develops. Each of these homologues produces a proximal portion, a stalk, and an end vesicle. The respective histological structures of the two end vesicles so resemble each other as to have been classically misinterpreted as being the same and so both end vesicles have been called photoreceptor organs. Further, later, minute histologic analysis shows that the latter is indeed a photoreceptor but that the former is a photogen. Both chromogen and photogen end vesicles lie outside of the cartilaginous cranium, their stalks passing inward through the foramen connecting end vesicle and proximal portion. The prosencephalon produces an indifferent hemispherical cortex in which no prefrontal mantle exists nor any pre-prefrontal. The rhinoproencephalon and its antimeric end organ are defective; the thalamoproencephalon with its antimeric end organs is fairly rudimentary; the upperprosencephalon with its antimeric end organ is even more rudimentary. The mesencephalon and metencephalon are defective. General antimerization of the cephalic and subcephalic metameres is so almost wholly wanting that not even mandibles exist; no limbs, not even paired fins.

Here in the cyclostomes is a type in which the formation of general external body photogen-chromogen complexes is forgone in favor of a single upperprosencephalic photogen-chromogen complex. But the attempt consists in the formation of two domes, a primary formation of the anlage of the homologue of the inferior lobe, followed later by the formation of a dome of an anlage of the superior lobe. The results are imperfect encephalization, imperfect prosencephalic antimerization, failure of general subencephalic antimerization, failure to form osseous tissue.

Another group of cartilaginous, vertebrate, encephalized Chordata, called the selachians, comprised of elasmobranch sharks, rays, chimeras, etc., do luminesce. They also produce a single epiphyseal dome upon which a homologue of the histologic inferior lobe makes more or less futile attempts

at development. A proximal portion, stalk and end vesicle occur in extremely rudimentary condition. The attempted end vesicle lies within a fossa in the cartilagenous cranium covered by epiderm.

Here is one type in which an attempt at the foregoing of general external body photogen-chromogen complexes in favor of a single uperprosencephalic photogen-chromogen complex was not attempted. The attempt consisted of the effort to produce both. The results were rudimentary attempts at encephalization, a rudimentary attempt at evolvement of the photogen portion of the epiphyseal complex together with successful full production of light-emitting organs externally over various parts of the body, and though less than with the Cyclostomata still markedly imperfect general evolvement of antimeres and failure of ossification.

The common bony fishes, called teleosts, do luminesce, are successful in the production of osseous tissue, do produce an epiphyseal dome. While producing an exuberance of general chromogen-photogen organs over their cephalic, subcephalic and sub-subcephalic exterior, this group of organisms tries out the production of just about every possibility of variation of the basic morphotic scheme of epiphyseal complex development upon this dome. None ever arrive at the production of the archetype.

Some produce upon this single dome a homologue of the histologic inferior lobe. Some having formed the single dome then extend it into two sagittally-aligned evaginations, the more caudad one being the larger, and upon which the homologue develops, its anlage appearing first and developing somewhat before the other evagination shows signs of anlage production. Upon this much smaller more rostrad evagination an anlage of the homologue of the histologic superior lobe appears feebly, transiently, soon disappears. By various devious methods, as though trying out all possibilities, this group of organisms conjures this anlage into semblances of those three exaggerated developments of the three histologic regions of the archetypal histologic inferior lobe which are known as a proximal region, stalk and end vesicle. The end vesicle lies just beneath the osseous cranium, covered with bone and integument. The failures of development of an encephalon are marked. No discernable uperprosencephalon evolves; the thalmanprosencephalon and its antimeric end organs are semi-good; the upoprosencephalon and its antimeric end organ would classify as all but complete failures; the mesencephalon and metencephalon not outranking it. Some general attempt at general antimeric development shows in fin formations, mandible and maxillary rudiments, etc.

Histologically the end vesicle of the homologue of the histologic inferior lobe in part resembles that of a secretory gland and in part something not quite glandular. It can be recalled here that all photogen organs are in part secretory fabricating their particular photogenic molecular substance. Here in the teleosts the attempt at transition from the production of general external photogen-chromogen complex of organs to the production of a single epiphyseal

complex manifests as a concentration upon photogenesis with failure of the photoreceptor portion of the complex. The high state of development of the photogen portion is evident. Writing of these various organisms of this group Harvey reports that on the surface of the body of some of the teleosts, "minute punctate photophores are densely arranged in patterns. Sometimes there may be 70 per square millimeter while in other regions only a few. Each photophore is pearly in the living condition, surrounded by black pigment."²³ Of others he writes, "a cup-shaped mass of photogenic tissue is partly surrounded by a pigment layer and capped with a clear region, more or less lens-shaped, through which the light shines and ... some of these organs possess lenses."²³ These are not so unlike the structure of the ivory-white body and its pigment nest as not to suggest a similarity worth considering.

The air-breathing lung fishes, the Dipnoi, produce no external photogen-chromogen complex of organs. Of the epiphyseal complex they produce an anlage of a homologue of the histologic inferior lobe only, which produces an indifferent proximal portion, stalk and end vesicle which lies deep within the head. Here transition of photogenesis, whether well or poorly so, is actually effected; chromogenesis of the complex is completely suppressed. The somatic and organic conglomerate, with its accompanying biochemical mix-up which results is obvious. A truly mixed-up transitional group, the Dipnoi are fascinating in their expressed irregularities of all recognized morphons. Some mix them in one way, others in other ways. For instance, neither purely aquatic nor at all amphibious, this class breathes both ways, under water by means of its gills, in the air by means of its lungs - and like that.

Of the amphibians none emit light in the human retinally visible gamut; none produce an external general body photogen-chromogen complex. All produce osseous tissue. The types vary from those in which general antimerization is markedly inferior to those in which it reaches rather a high level. During ontogenesis at first gill-breathers they later become lung-breathers. The salamanders and newts have retained the sub-subcephalic region as a tail; the Anura, frogs, toads and tree-toads, amputate the sub-subcephalic region at the same time that they suppress gill growth in favor of lungs and cease being purely aquatic tadpoles.

In 1903, John Cameron published that portion of his works which dealt with the origin of the epiphyseal arch or dome in the amphibia, *Rana*, *Bufo* and *Triton*.²⁴ In this he reports finding the arch arising as two bilateral arches which subsequently fuse across the midline to form a single dome. Other researchers found upon this single dome, at a few hours later development, a single anlage: the anlage of the homologue of the histologic inferior lobe which developed a fairly complexly organized proximal portion, an indifferent stalk and end vesicle. No anlage of the homologue of the histologic superior lobe makes an appearance in any amphibian according to the consensus of researchers, with the exception of one reported by Beraneck²⁵ who thought that he found a small transitory anlage of the homologue of the histologic superior lobe in *Bufo*, which appeared later than the inferior anlage and soon disappeared.

Here in the *Rana* genus of amphibians with their suppression of the superior anlage, the indifferent production of the stalk and end vesicle accompanying a beginning complexity of organization of the proximal portion of the inferior anlage is to be seen, the complete suppression of both general external and epiphyseal photogen-chromogen complex formation, with a dependence of the ontogen upon the proximal portion of the inferior anlage for its further evolvment. The manner in which *Rana* organisms produce the critical mass and the notochord, the various attempts at encephalization, the manner in which they form their blastospheric morph, the manner of origin upon that morph of the metamorphosing form bespeak a willingness of this particular protoplasm to attempt to concentrate its functions; a willingness, however, which, misdirected, instead of producing a single organ which would comprise the entire photogen-chromogen complex resulted in the complete suppression of all save one of the elements of the complex with the accompanying defects in morphon building.

The Reptilia extinct and extant comprise the prosaurians, saurians, Ophidia, Chelonia and Crocodilia, experiment all the way from the sole production of an inferior anlage which becomes a solid mass not too unlike what *Rana* organisms do with the proximal portion, to the production of elaborate evolvment of each and every separate part of the complex variously in the various forms. The prosaurians are lizard-like reptiles with a large snout, called Rhychnocephalia, extinct now save *Sphenodon punctatum*, formerly of New Zealand and New Zealand's surrounding islets now only of these islets, called tuatara by the native Maoris. Saurian means lizard-like, so does the word Lacertilia. The saurians comprise the extinct flying lizards called Pterosauria; the extinct Dinosauria, long-necked, long-tailed, large size; the seemingly extinct Ichthyosauria and Sauropterygia, large fish-like marine lizard-like reptiles; Theromorpha, seemingly extinct mammal-like, lizard-like, land reptiles; the extant lizards and their like including the iguana, gecko, chameleon, gila monster; the extant limbless, vertebrated, encephalized Ophidia or snakes; the extant Chelonia or turtles; and the extant Crocodilia, including crocodiles and alligators. No one as yet has found any evidence of any portion of the epiphyseal complex in crocodiles and alligators. The turtles and snakes produce no anlage of the homologue of the vorderlappen; the anlage of the homologue or analogue of the hinterlappen develops as a single dome with a single hollow evagination which becomes a solid pedunculated structure.

In extant saurians and prosaurians a single dome gives rise to two sagittally-related diverticula upon the more rostral one of which the anlage of the homologue or analogue of the vorderlappen and upon the more caudad one the anlage of the homologue or analogue of the hinterlappen develop. Various among those extant pro-saurians and saurians, these anlagen as they develop produce, each, an end organ, a stalk and a proximal portion. Various in the various forms, the homologue or analogue of the homozoan histologic superior lobe produces a proximal portion, a stalk and an end vesicle which last when compared histologically with eyes, proves to be a photoreceptor

mechanism of some kind. The various homologues or analogues of the anlage of the neohomozoan histologic inferior lobe produces a proximal portion, a stalk and an end vesicle, the histology of which when compared with that of other photogen organs shows the histologic similarity and emphasizes the few disqualifying dissimilarities of these histologies and those of photoreceptor organs.

In samples of the extant cyclostomes, of the sole extant protosaurian and of the extant saurians the tendency toward development of two different sets of organs for the two differing functions of the epiphyseal complex reaches the highest state of the trend. In homozoa the archetypal morphosis produces a single organ in which these functions are minutely histologically interrelatedly evolved. In other samples of the saurians, in samples of *Rana*, of snakes and of turtles, the tendency toward the elimination of all mechanism of the production of any function other than that of one portion of the histologic inferior lobe of the archetype reaches the state next to the complete elimination of the complex.

The birds are fully osseously skeletoned, well antimerized, encephalized, produce upperprosencephalic hemispheres of a sort. No external photogen-chromogen complex of organs occurs, and in those of the Aves which have been examined no indication of the chromogen portion of the epiphyseal photogen-chromogen complex has been found, and a differentiation of the chromogen specialization of the chromogenic portion of the complex in the formation of an end vesicle and stalk appears but transiently only to disappear permanently in each ontogen. In these birds only the proximal portion of the homologue or analogue of the histologic inferior lobe develops. But it does develop markedly in size and in histologic complexity. Anatomically it is separated from but is equipped with peduncular attachments to the developing roof plate of the forebrain. This means that in these forms the tubular extension of the antimeric developmental region of the upperprosencephalon produces an end bulb on the blind end of that tubular extension by proliferation of only its more caudad cells. And upon this ill-formed end bulb an end organ has developed which is wholly lacking in that portion of the archetype which in neohomozoa is produced by the development of the vorderlappen. The manner of development of that single end bulb either varies among the different varieties of the Aves or some of the researchers in this field have failed to examine specimens early enough in embryonal development; for some reported finding a single dome, while others found bilateral evaginations which then fused in the formation of a single dome, and still others reported finding two evaginations in sagittal alignment, the more forward one of which then disappeared.

The fact of bilaterality having become established and unwillingly accepted by the adherents of the older generalization, the occurrence was then classified by these as anomalous development. In 1897, Saint Remy²⁶ reported finding bilateral evaginations of the medullary ridges before dorsal closure in a chick, *Gallus domesticus*, in the region of the presumptive epiphyseal arch; but fell in with the line of thought which considered this to be an anomaly. However,

in 1963, Cullen reported in detail bilateral evaginations of the medullary ridges of this region during the hours approaching dorsal closure in five chick embryos.²⁷

Cameron reported finding two bilateral evaginations after closure in the amphibian *Bufo* which then soon coalesce across the midline forming a single epiphyseal dome. Upon this dome, soon appears the anlage of the homologue of the histologic inferior lobe which subsequently becomes differentiated into proximal portion, stalk and a phantom end vesicle which soon disappears together with the stalk. The proximal portion remains and undergoes rapid development.

Of the extrahuman mammals reported upon at the time of Tilney and Warren's compilation, only in two cases has any appearance of the anlage of the homologue or analogue of the *vorderlappen* been observed. Reichert and Mihalkovicz,²⁸ Tilney, and Tilney and Warren, in that order, report a finding of Reichert's in which the single epiphyseal dome of *Felis domesticus* produces two sagittally placed diverticula, separated by a thick *pars intermedia*, the more rostral one of which remains for some few days then seemingly disappears. It could here be suggested that rather than regressing and disappearing, it and the *pars intermedia* become fused histologically with the much more rapidly growing more caudad diverticulum. Cutore²⁹ reported two distinct sagittally placed evaginations in a new-born *Bos taurus* which he considered to be two anlagen, one of a parapineal and one of a pineal, respectively, the former being present as a small protuberance just rostral to the larger anlage of the analogue or homologue of the *hinterlappen*. In all other extrahuman mammalia only the proximal portion of the homologue or analogue of the histologic inferior lobe has so far been found to develop. Disregarding all established evidence to the contrary, Tilney and Warren, not alone in the effort, attempted to extend this same interpretation to homoza, evidently looking at it only externally, in bulk internally and misconstruing what is actually a compact homozoan histologic interorganization of the various contributing factors for a suppression of all save one of the factors of the complex. Krabbe questioned, but fell by the wayside when he found the infiltration of the mesodermal cells, since such infiltration was, at the time, mistakenly considered to be an infallible sign of regression and deterioration. Turkewitsch, in his vast work, incontrovertibly proving the various factors, still could not quite overcome the sense of being stymied by an inability to interpret the mesodermal infiltration. It remained for Hortege to harbinge the knowledge of the fact that the parenchyma cells, that is the cells produced by the proliferation of the original cells of the *vorderlappen*, *hinterlappen*, in this gradual development after the mesodermal infiltration, orient themselves chemobiotactically to the mesodermal tissue. Seemingly it remains for this present work to interpret the fact; some part of which interpretation is the meaning of the formation and functioning of the mesodermal ivory-white bodies in their ectodermal cellular nests.

May one pause now and, with logic, draw this conclusion: left alone, by itself, that phase of the cosmic law which is the law of protoplasmic morphosis

as operating in this planetary system of this solar system produces an upperprosencephalic photogen-chromogen complex which in the homozoan form is to be seen as the histologic inferior and superior lobes and the pars intermedia, and in the extrahuman forms is to be seen as those various morphons which collectively are known to comparative morphology as pineal and parapineal, respectively. In all of its progressive stages extrahuman cosmic morphosis differs from homozoan cosmic morphosis in that the former is the expression of that constant, dynamic, progressive and cumulative cosmic evolvement as interpreted by the fundamental cosmic type n d n, while the latter is the homologous phase of the expression of that constant, dynamic, progressive and cumulative cosmic evolvement as interpreted by the fundamental human cosmic type n d n.

¹See Book II, Chapter XII appendix.

²Drawings are available at the Museum of OsteopathySM in their Online Dr. Charlotte Weaver Collection filed as 2-14-1a (www.atsu.edu/museum).

³William Wallace Martin, Jr., B.S. Northwestern, D.Z., Dr Charlotte Weaver Foundation Seminary.

⁴Drawings are available at the Museum of OsteopathySM in their Online Dr. Charlotte Weaver Collection filed as 2-14-1b (www.atsu.edu/museum).

⁵Drawings are available at the Museum of OsteopathySM in their Online Dr. Charlotte Weaver Collection filed as 2-14-1c (www.atsu.edu/museum).

⁶Frederick Tilney and Luther F. Warren, 1919, *The Morphology and Evolutional Significance of the Pineal Body*, *The American Anatomical Memoirs*, Number 9, February 1919, p. 161, Fig. 77.

⁷J. Henle, 1871, *Nervenlehre*. In *Handbuch der Anatomie, Braunschweig. Bd. 3, Abt. 2, S. 288*. 1879, *Handbuch der Nervenlehre*. 1887, *Handbuch der Systematischen Anat. des Menschen. Nervenlehre* cited by Tilney and Warren, *op cit*.

⁸J. A. Wenzel, 1812, "*De penitiori structura cerebri hominis atque brutorum.*" *Tuggingae*, as cited by Tilney and Warren, *op cit*, pg. 172.

⁹Max Flesch, 1888, "*Über die Deutung der Zirbel bei den Säugetieren,*" *Anat. Anz.*, Bd. 3, as cited by Tilney and Warren, *op. cit.*, p 161.

¹⁰Missing in author's manuscript. [ED.]

¹¹Book One, Chapter VI, Sec. iii, subsec. b.2, The Bony Axis.

¹²Book Two, Chapter IV, Sec. iii, Light, and Chapter V, Sec. x, Subsec. h., American Canon Re. Fundamental Material Energy Forms and Fundamental Vibratory Energy Forms and Waves.

¹³As cited by E. Newton Harvey, *Living Light* (Princeton: Princeton University Press, 1940).

¹⁴Sir Arthur Keith, *Human Embryology and Morphology*, 5th ed. (London: Edward Arnold Co., 1933), pp. 18, 44.

¹⁵Joseph Needham, *Biochemistry and Morphogenesis* (Cambridge: The University Press, 1933), pgs. 156 and 186.

¹⁶*Ibid*, p. 247.

¹⁷Book One, Chapter VII, Sec. i, Subsec. d, The Anatomic Prosencephalon; Chapter XII, Sec. i, The Neohomozoan Uperprosencephalon; Chapter XXX, Sec. i, Epicritic Awareness and the Prefrontal Association Mantle of the Uperprosencephalon.

¹⁸Book One, Chapter XII, Sec. i, Subsec. c, Ontogenesis of the Neohomozoan Epiphyseal Complex.

¹⁹The author intended a full discussion of this topic in Book 3. Book 3 was incomplete at author's death. Incomplete manuscript and notes for Book 3 are available at the Museum of OsteopathySM in their Online Dr. Charlotte Weaver Collection. (www.atsu.edu/museum). [Ed.]

²⁰Harvey, *op.cit.* Chapter II.

²¹Tilney and Warren, *op cit.*

²²Harvey, *op cit.*, p. 77.

²³*Ibid*, p. 83-85.

²⁴John Cameron, 1903, "On the origin of the pineal body as an amesial structure," *Anat. Anz.*, Bd. 23, S.394; same in extenso. *Proc. of the Royal Society of Edinburgh*, Vol. 3, p 340, as cited by Tilney and Warren, *op. cit.*

²⁵E. Beraneck, 1893, "Contribution a l'embrogenie de la gland pineale des Amphibians," *Revue Suisse de Zoologie*, as cited by Tilney and Warren, *op. cit.*

²⁶G. Saint Remy, 1897. "Notes teratologiques. I, Ébauches épiphysaires et paraphysaires paires chez un embryon de poulet monstrueux," *Bibliographie anatomique*, T.5, as cited by Tilney and Warren, *op. cit.*, p. 67.

²⁷See Appendix, Book 2, Chap.12, Sec. 7-b-2.

²⁸K. B. Reichert, 1859-1861, "Der Bau des menschlichen Gehirns. 2" *Abt. Leipzig*; V. Mihalkovicz, 1874, "Entwicklung der Zirbeldrüse," *Zentralb. f. med. Wiss*, No. 17, and 1877, "Entwicklungsgeschichte des Gehirns," *Leipzig*, S.94, as cited by Tilney and Warren, *op. cit.*

²⁹G. Cutore, 1909, "Di una particolare formazione prepineale nel *Bos taurus*" *L. Arch. di Anat. e di Embriologia*, T.3. See also, 1910, "Il corpo pineale di alcuni mammiferi," *Arch. Ital. di Anat. e di Embriol.*, T.9, p. 402, as cited by Tilney and Warren, *op. cit.*

